

Applicant : Andreas N. Wiswesser et al.
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Attorney's Docket No.: 05542-369003 / 2562C2/CMP

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-21. (Cancelled)

22. (Currently Amended) A chemical mechanical polishing apparatus to polish a substrate, comprising:

a platen to support a polishing pad, the platen being rotatable about an axis and, the platen including a plurality of optical apertures positioned at different angular positions about the axis;

a carrier head to hold a substrate against the polishing pad;

~~a plurality of optical systems located in the platen, each of the plurality of optical systems including a light source to independently generate a light beam and direct the light beam through an associated one of the plurality of optical apertures, and a sensor to independently measure light from the light beam that is reflected from the substrate to independently generate an intensity signal; and~~

a first optical system located in the platen and including a first light source to generate a first light beam that is directed through a first one of the plurality of optical apertures, the first optical system including a first sensor to measure light from the first light beam that is reflected from the substrate to generate a first intensity signal;

a second optical system located in the platen and including a second light source to generate a second light beam that is directed through a second one of the plurality of optical apertures, the second optical system including a second sensor to measure light from the second light beam that is reflected from the substrate to generate a second intensity signal, the first and second light beams having different effective wavelengths; and

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a processor to receive the intensity signal from each of the plurality of optical systems and determine a polishing endpoint.

23. (Canceled)

24. (Canceled)

25. (Currently Amended) The apparatus of claim 22-24, wherein the first light beam and the second light beam have different wavelengths.

26. (Currently Amended) The apparatus of claim 22-24, wherein the first optical system is an off-axis optical system and the second optical system is a normal-axis optical system.

27. (Previously Presented) The apparatus of claim 22, wherein the plurality of optical apertures are spaced evenly about the axis.

28. (Original) The apparatus of claim 27, wherein the platen includes exactly two optical apertures.

29. (Currently Amended) The apparatus of claim 22, further comprising a polishing pad supported on the platen, the polishing pad having a plurality of windows, each of the plurality of windows being aligned with an associated one of the plurality of optical apertures in the platen.

30. (Previously Presented) The apparatus of claim 22, wherein at least one light beam has a wavelength of about 300-400 nm.

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31-37. (Canceled)

38. (Currently Amended) The apparatus of claim 22-23, wherein the first light beam and the second light beam have the same propagation angle.

39. (Currently Amended) The apparatus of claim 22-24, wherein the first optical system and the second optical system are off-axis optical systems.

40. (Currently Amended) The apparatus of claim 22-23, wherein the first light beam and the second light beam have the same wavelength.

41. (Previously Presented) The apparatus of claim 22, wherein the second light beam has a second wavelength that differs from a first wavelength of the first light beam.

42. (Previously Presented) The apparatus of claim 22, wherein the plurality of optical apertures are about the same distance from the axis.

43. (Previously Presented) The apparatus of claim 27, wherein the plurality of optical apertures are about the same distance from the axis.

44. (Previously Presented) The apparatus of claim 22, further comprising an opaque polishing pad positioned on the platen, the polishing pad including a plurality of windows formed in the polishing layer and aligned with the plurality of optical apertures in the platen.

45. (Previously Presented) The apparatus of claim 44, wherein the polishing pad includes a polishing layer and a backing layer.

46. (Previously Presented) The apparatus of claim 44, wherein the windows include a solid light-transmitting material.

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47. (Previously Presented) The apparatus of claim 22, wherein at least one light beam has a wavelength of about 600-1500 nm.